Quarterly Groundwater Monitoring Report
First Quarter 2005

City of Arcata Corporation Yard
Arcata, California
Case No. 1NHU767

Prepared for:

The City of Arcata

Consulting Engineers & Geologists, Inc.

812 W. Wabash Avenue
Eureka, CA 95501-2138
707 / 441-8855

May 2005
000108.100

CONSULTING ENGINEERS & GEOLOGISTS, INC.
812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • info@shn-eureka.com

Reference: 000108.100

May 13, 2005

Mr. Kim Watson, Superintendent of Public Works
City of Arcata
736 F Street
Arcata, CA 95521

Subject: **Quarterly Groundwater Monitoring Report, First Quarter 2005, City of Arcata Corporation Yard, 600 South G Street, Arcata, California; Case No. 1NHU767**

Dear Mr. Watson:

This report presents the results of the quarterly groundwater-monitoring event, the operation of the groundwater extraction system, and biopile monitoring at the City of Arcata, Department of Public Works Corporation Yard for the first quarter of 2005. This work was performed by SHN Consulting Engineers & Geologists, Inc. (SHN) in accordance with our service agreement with the City of Arcata. City of Arcata employees conducted the first quarter monitoring activities on, January 19, 2005.

SHN is requesting a final round of confirmation sampling for the biopile and subsequent closure. SHN is also recommending the existing groundwater pump-and-treat system be replaced with an air sparge system that uses the existing groundwater excavation piping.

If you have any questions, please call me at 707/441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

Mike Foget, P.E.
Project Engineer

MKF/ADM:lms
Attachment: Report
copy w/attach: Steve Tyler, City of Arcata
Ron Allen, RWQCB
Melissa Martel, HCDEH

Reference: 000108.100

Quarterly Groundwater Monitoring Report
First Quarter 2005

City of Arcata Corporation Yard
600 South G Street
Arcata, California

Prepared for:

The City of Arcata

Prepared by:

Consulting Engineers & Geologists, Inc.
812 W. Wabash Avenue
Eureka, CA 95501-2138
707/441-8855

May 2005

QA/QC:MKF___

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Abbreviations and Acronyms

<	Denotes a value that is “less than” the method detection limit
ppm	parts per million
ug/g	micrograms per gram
ug/L	micrograms per Liter
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
DIPE	Diisopropyl Ether
EPA	(U. S.) Environmental Protection Agency
ETBE	Ethyl Tertiary-Butyl Ether
MSL	Mean Sea Level
MTBE	Methyl Tertiary-Butyl Ether
MW-#	Monitoring Well-#
RAIR	Remedial Action Implementation Report
SHN	SHN Consulting Engineers & Geologists, Inc.
TAME	Tertiary-Amyl Butyl Ether
TBA	Tertiary-Butyl Alcohol
TPHD	Total Petroleum Hydrocarbons as Diesel
TPHG	Total Petroleum Hydrocarbons as Gasoline
TPHMO	Total Petroleum Hydrocarbons as Motor Oil
VOC	Volatile Organic Compound

1.0 Introduction

This report presents the results of groundwater monitoring activities, groundwater extraction, and monthly biopile monitoring for the first quarter 2005, conducted at the City of Arcata Corporation Yard. Under the direction of SHN Consulting Engineers & Geologists, Inc. (SHN), the City of Arcata (Arcata) conducted the quarterly monitoring of six groundwater wells located at their corporation yard. The site is located on South G Street adjacent to Butcher's Slough and Arcata Bay. The corporation yard houses the City of Arcata's wastewater treatment plant and the Department of Public Works' vehicle maintenance and equipment storage facilities. The site lies within Section 32 of Township 5 North, Range 1 East, Humboldt Base and Meridian (Figure 1).

First quarter 2005, monitoring activities are presented in five sections. This section serves as an introduction for the report. Section 2.0 describes the field program for the work conducted during this monitoring event. Section 3.0 includes a discussion of the results of the monitoring activities. Section 4.0 presents our conclusions and site recommendations. Section 5.0 includes references cited in this report.

The objective of this work was to assess groundwater conditions beneath the site over time.

2.0 Field Activities

2.1 Monitoring Well Sampling

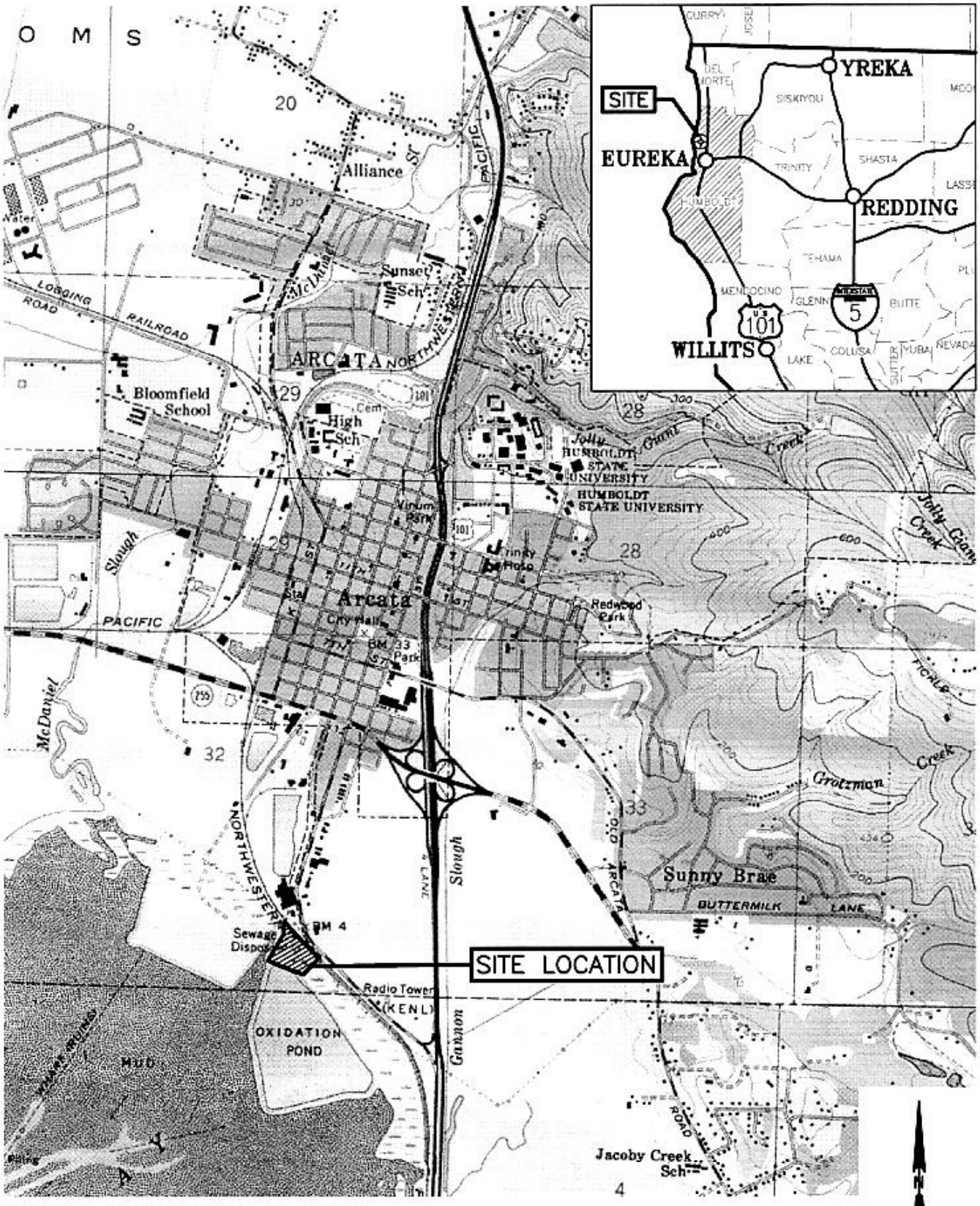
On January 19, 2005, City of Arcata personnel performed groundwater monitoring in wells MW-1 through MW-6, to aid in assessing current groundwater conditions beneath the site, including the direction of groundwater flow. A site map showing the locations of the existing monitoring wells is included as Figure 2. As part of the groundwater-monitoring program, each well was measured for depth to groundwater and sampled for water quality. During purging, each well was monitored for electrical conductivity and temperature using portable instrumentation, and pH was measured using portable pH test strips.

Upon completion of the well purging activities, a groundwater sample was collected from each well using a disposable polyethylene bailer, and transferred into laboratory-supplied containers. The water samples were then labeled, stored in an iced cooler, and transported to the laboratory under proper chain-of-custody documentation. Field notes from the January 19, 2005, groundwater-monitoring event are included in Appendix A.

2.2 Laboratory Analytical Methods

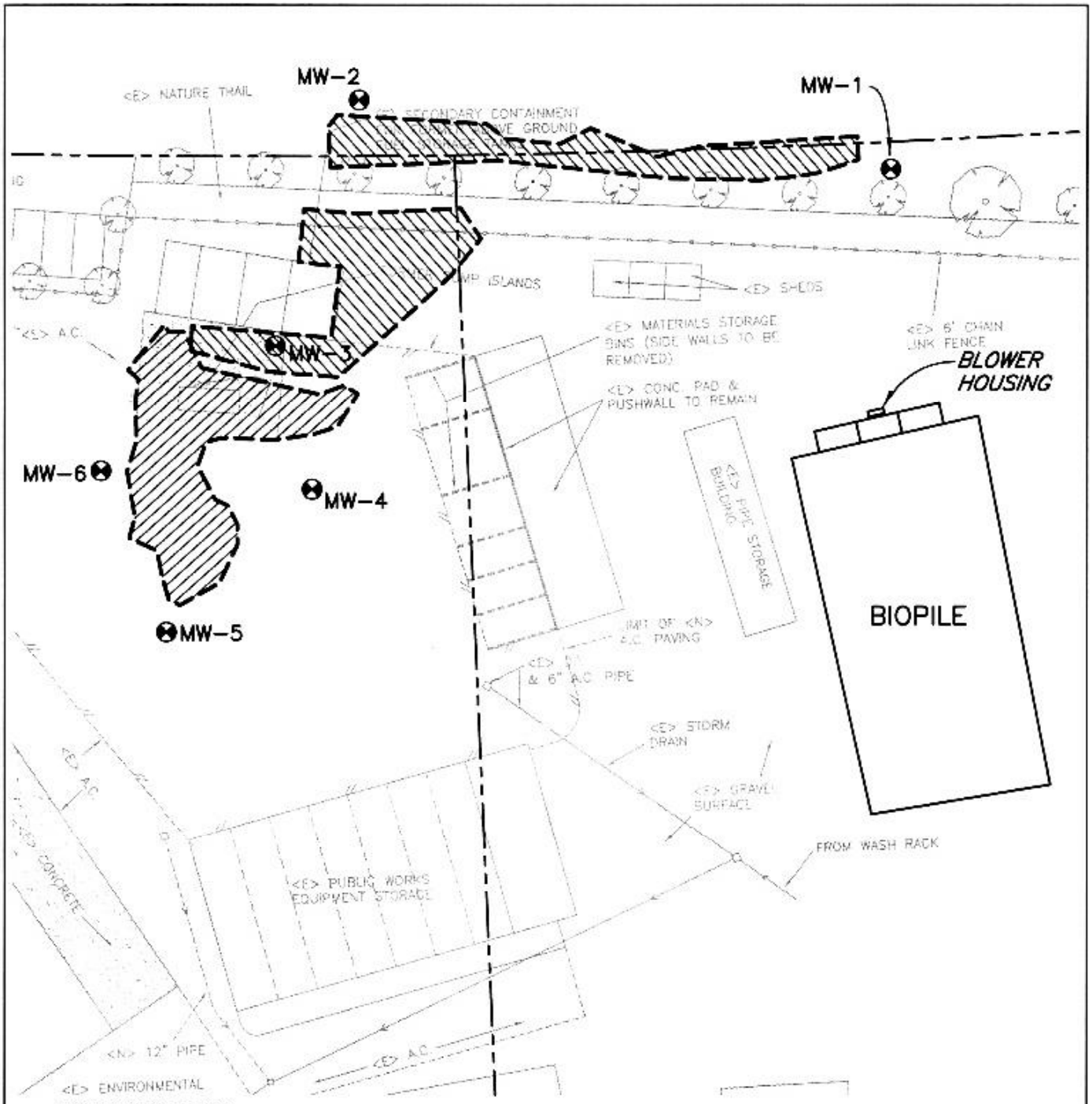
Each of the groundwater samples was analyzed for:

- Total Petroleum Hydrocarbons as Diesel (TPHD) with silica gel clean up in general accordance with U.S. Environmental Protection Agency (EPA) Method No. 3510 GCFID.
- Total Petroleum Hydrocarbons as Gasoline (TPHG) and Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) in general accordance with EPA Method No. 8260B Modified.
- Fuel Oxygenates in general accordance with EPA Method No. 8260B Modified.



SOURCE: ARCATA NORTH & SOUTH
USGS 7.5 MINUTE
QUADRANGLE

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California	Site Location Map SHN 000108.100	
	MAY 2004	000108.100-VIC-MAP	Figure 1



EXPLANATION

MW-5 *MONITORING WELL LOCATION AND DESIGNATION*

LIMIT OF EXCAVATION NOVEMBER 2000

LIMIT OF EXCAVATION OCTOBER 2001

1"=40'±

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California		Site Plan SHN 000108.100
	May, 2004	000108.100-SI1	Figure 2

All of the sample analyses were performed by North Coast Laboratories Ltd., a state-certified analytical laboratory located in Arcata, California.

2.3 Equipment Decontamination Procedures

All well purging and sampling equipment was cleaned prior to being transported to the corporation yard site. All small equipment that required on-site cleaning was decontaminated utilizing the triple wash system. The equipment was first washed in a water solution containing Liquinox® cleaner, followed by a water rinse, then by a distilled water rinse. All of the groundwater samples were collected using pre-cleaned, disposable bailers, and transferred into laboratory-supplied containers.

2.4 Investigation-Derived Wastewater Management

Water used for decontaminating field equipment and all well purge water was placed into 5-gallon buckets, and subsequently transported to, and disposed of at the City of Arcata wastewater treatment facility.

3.0 Groundwater Monitoring Results

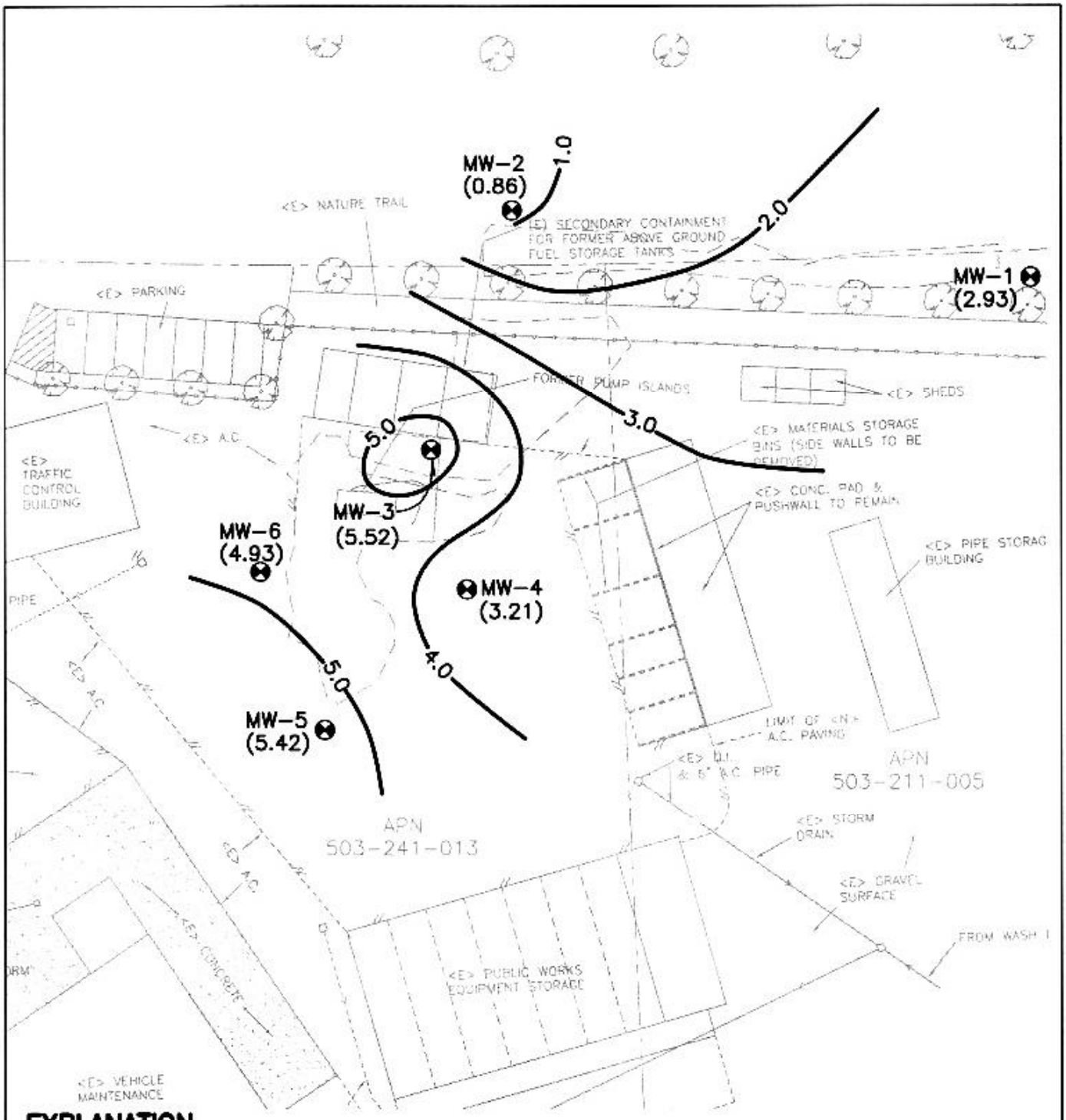
3.1 Hydrogeology

Depth-to-groundwater measurements were collected from each monitoring well prior to sampling, and are shown in Table 1. On January 19, 2005, the direction of groundwater flow beneath the site was inconsistent (Figure 3). Gradient calculations were not performed for the first quarter 2005, but historically, groundwater flows to the northeast. Historical groundwater elevation data are included in Appendix B, Table B-1.

Table 1
Groundwater Elevations, January 19, 2005
City of Arcata Corporation Yard, Arcata, California

Sample Location	Top of Casing Elevation [1] (feet MSL)[2]	Depth To Water (feet) [3]	Water Surface Elevation[1] (feet MSL)
MW-1	8.73	5.80	2.93
MW-2	9.86	9.00	0.86
MW-3	6.97	1.45	5.52
MW-4	6.96	3.75	3.21
MW-5	6.83	1.41	5.42
MW-6	6.73	1.80	4.93

1. Top of casing elevation referenced to City of Arcata Bench Mark #4, elevation.
2. Mean Sea Level (MSL).
3. Depth to water in feet below top of casing.



EXPLANATION

MW-5 — *MONITORING WELL LOCATION AND DESIGNATION*

(5.42) — *GROUNDWATER ELEVATION (FEET MSL)*

—3.0— *GROUNDWATER CONTOUR (FEET MSL)*

1"=40'±

SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California		Groundwater Contours January 19, 2005 SHN 000108.100
	April, 2005	000108.100-GWC-jan-05	Figure 3

3.2 Groundwater Analytical Results

The laboratory analytical results from the January 19, 2005, groundwater-monitoring event are summarized in Table 2, and shown on Figure 4.

Table 2
Groundwater Analytical Results, January 19, 2005
City of Arcata Corporation Yard, Arcata, California
(in ug/L)[1]

Sample Location	TPHD[2]	TPHG[3]	B[4]	T[4]	E[4]	X[4]	MTBE[4]	TBA[4]	DIPE[4]	ETBE[4]	TAME[4]
MW-1	<50[5]	<50	<0.50	<0.50	<0.50	<1.0	4.6	<10	<1.0	<1.0	<1.0
MW-2	<50	<50	<0.50	<0.50	<0.50	<1.0	33	<10	<1.0	<1.0	1.7
MW-3	<50	120[6]	1.5	<0.50	<0.50	<1.0	110	<45[7]	<1.0	<1.0	4.0
MW-4	<50	410[6]	<0.50	<0.50	<0.50	<1.0	380	<10	<1.0	<1.0	12
MW-5	440[8]	530[9]	<0.50	<0.50	<0.50	<1.0	240	<90[7]	<1.0	<1.0	6.0
MW-6	81[8]	170[6]	<0.50	<0.50	<0.50	<1.0	130	46	<1.0	<1.0	4.1

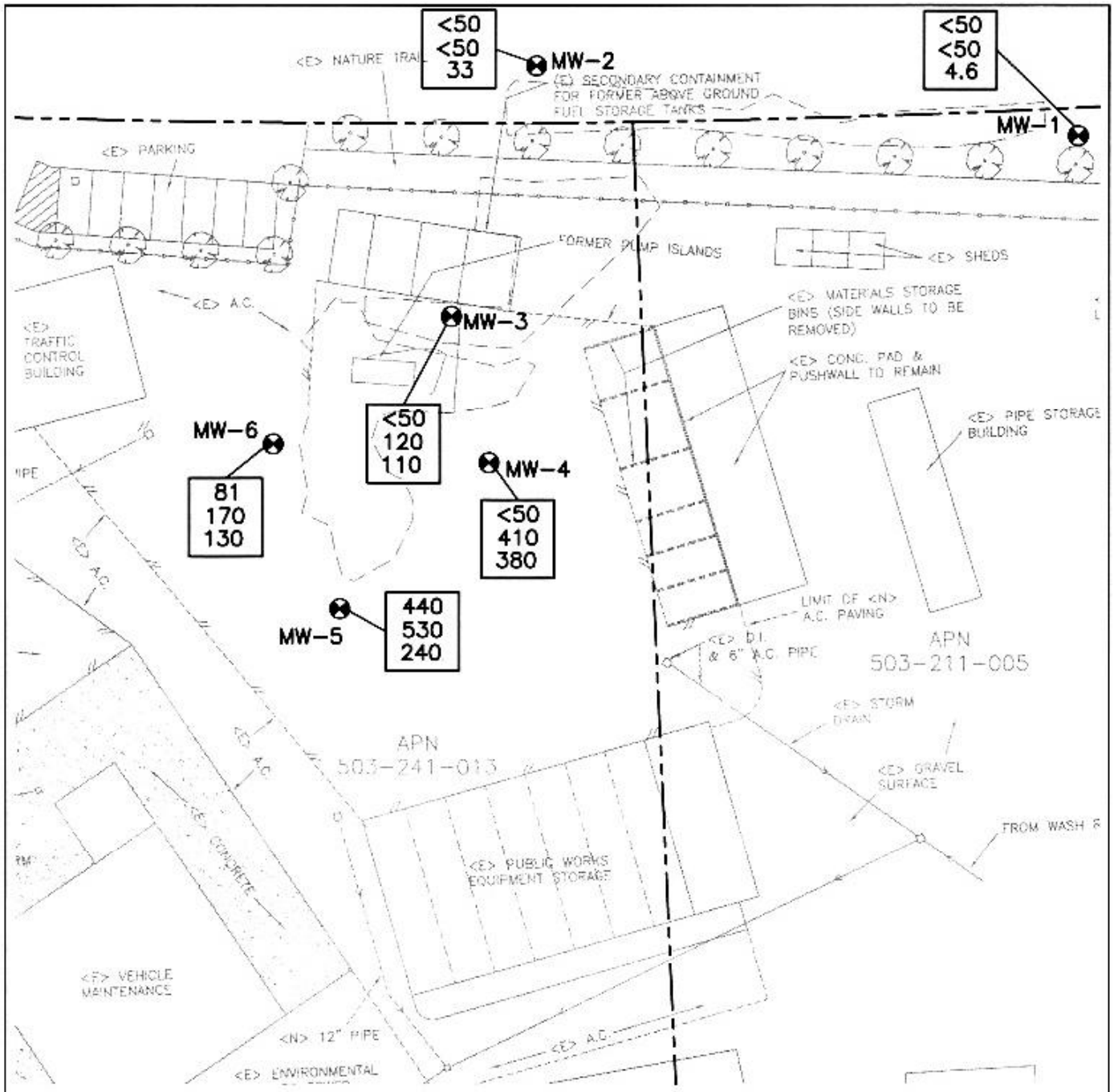
1. ug/L: micrograms per liter.
2. TPHD: Total Petroleum Hydrocarbons as Diesel analyzed in general accordance with EPA Method 3510/GCFID.
3. TPHG: Total Petroleum Hydrocarbons as Gasoline analyzed in general accordance with EPA Method 8260B.
4. Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX); Methyl Tertiary-Butyl Ether (MTBE), Tertiary-Butyl Alcohol (TBA), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), and Tertiary-Amyl Butyl Ether (TAME), analyzed in general accordance with EPA Method 8260B.
5. <: Denotes a value that is " less than" the method detection limit.
6. The gasoline values are primarily from the reported additives.
7. Reporting limits were raised due to matrix interference.
8. Sample contains material similar to degraded or weathered diesel oil
9. The sample includes the reported gasoline compounds and additives in addition to other peaks in the gasoline range.

TPHD was detected in the groundwater samples collected from wells MW-5 and MW-6 at concentrations of 440 micrograms per liter (ug/L) and 81 ug/L, respectively. TPHG was detected in the groundwater samples collected from four of the monitoring wells, at concentrations ranging from 120 ug/L in well MW-3, to 530 ug/L in well MW-5. TPHG was not detected in the groundwater samples collected from MW-1 and MW-2. TPHG values observed in MW-5 include reported gasoline additives. Benzene was detected in the groundwater sample collected from MW-3. No detectable concentrations of benzene, toluene, ethylbenzene, or total xylenes were present in any other samples collected during the January 2005 sampling event.

Methyl Tertiary-Butyl Ether (MTBE) was detected in all of the groundwater samples that were collected during the January 19, 2005, monitoring event. Historical groundwater analytical results are presented in Appendix B, Table B-2. The complete laboratory analytical report and corresponding chain-of-custody documentation are included in Appendix C.

3.3 Groundwater Extraction and Treatment System

The groundwater extraction and treatment system was activated May 17, 2004. The system is operational, but due to seasonal water levels, the system has been off line during periods of low



SHN Consulting Engineers & Geologists, Inc.	City of Arcata Corp. Yard 600 South G Street Arcata, California	Groundwater Contaminant Concentrations, January 19, 2005 SHN 000108.100	
	February, 2005	000108.100-CONTAM-CONC-jan-05	Figure 4

groundwater. To date, 126.99 cubic feet (approximately 950.2 gallons) of groundwater have been extracted and treated by the system. Groundwater extraction and treatment system monthly operation data are shown in Table 3.

Table 3
Groundwater Extraction and Treatment System Monthly Operation Data
City of Arcata Corporation Yard, Arcata, California

Date	Meter Readings		Total Water Extracted	
	Start (cubic feet)	Finish (cubic feet)	(cubic feet)[1]	(gallons)
May 2004	0.09	10.45	10.36	77.5
June 2004	10.45	12.44	1.99	14.9
July 2004	12.44	14.29	1.85	13.8
August 2004	14.29	16.11	1.82	13.6
September 2004[2]	16.11	16.11	0	0
October 2004	16.11	32.08	15.97	119.5
November 2004	32.08	42.17	10.09	75.5
December 2004	42.17	67.60	25.43	190.2
January 2005	67.60	105.69	38.08	284.9
February 2005	105.69	116.38	10.69	80.1
March 2005	116.38	127.09	10.71	80.2
		Total	126.99	950.2

1. 1 cubic foot = 7.48 gallons
2. The extraction and treatment system did not operate September 2004.

3.4 Biopile Monitoring

The biopile was constructed in September 2003 and is monitored monthly for blower manifold readings, soil temperature readings, and general condition observations. The biopile is monitored quarterly for Volatile Organic Compounds (VOCs), percent oxygen, percent carbon dioxide, and temperature. Soil samples are collected semi-annually from the biopile. During the March 10, 2005, quarterly biopile-monitoring event, VOCs were detected in all sample ports with concentrations ranging from 40 parts per million (ppm) in Ports #1, 2, and 4 to 100 ppm in Port #5. Field notes from the March 10, 2005, quarterly biopile monitoring event are included in Appendix A.

Table 4 summarizes the pre-treatment (stockpile) and the post-treatment (biopile) soil sample analyses. In comparing the geometric and arithmetic means of the sample results from the stockpile to those from the March 2005 sampling event, TPHG concentrations have been substantially reduced and TPHD concentrations have been slightly reduced. The mean concentrations of Total Petroleum Hydrocarbons as Motor Oil (TPHMO) were greater in March 2005 than the mean results from the initial stockpile sampling. BTEX and MTBE were not detected in the soil samples from the March 2005 sampling event.

Table 4
Stockpile/Biopile Petroleum Hydrocarbons Concentrations
City of Arcata Corporation Yard
(in ug/g)[1]

Sample Location	Date	TPHG[2]	TPHD[3]	TPHMO[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Total Xylenes[4]	MTBE[4]
Stockpile Samples									
SP1A	9/5/2002	2.9	95	160	0.019	0.013	0.015	0.048	<0.050[5]
SP1B	9/5/2002	2.5	22	60	0.017	0.0096	0.0095	0.0286	<0.050
SP2A	9/5/2002	7.9	120	110	0.0054	<0.040	0.011	0.032	<0.050
SP2B	9/5/2002	190	740	260	<0.0050	<0.015	<0.040	<0.10	0.11
SP3A	9/5/2002	4.7	73	85	0.19	0.017	0.0099	0.052	<0.050
SP3B	9/5/2002	29	150	130	0.028	<0.050	0.039	0.12	<0.050
SP4A	9/5/2002	2.0	1.2	10	<0.0050	<0.020	0.0057	0.039	<0.050
SP4B	9/5/2002	2.0	21	63	<0.0050	<0.030	<0.0050	0.034	<0.050
Geometric Mean		7.0	52	81	--	--	--	--	--
Arithmetic Mean		30.1	152.8	109.8					
Biopile Samples									
SP-1A,B,C,D	9/12/2003	3.1	53	85	<0.005	<0.005	<0.005	0.019	<0.05
SP-1E,F,G,H	9/12/2003	3.3	70	73	<0.005	<0.005	<0.005	0.008	<0.05
Geometric Mean		3.2	61	79	--	--	--	--	--
SP-1A,B,C,D	3/5/2004	1.6	87	120	<0.005	<0.005	<0.005	0.0085	<0.05
SP-1E,F,G,H	3/5/2004	1.5	73	160	<0.005	<0.005	<0.005	0.0144	<0.05
Geometric Mean		1.5	80	139	--	--	--	--	--
SP-1A,B,C,D	9/21/2004	2.2	34	74	<0.0058	<0.012	<0.0058	0.011	<0.058
SP-1E,F,G,H	9/21/2004	2.1	58	86	<0.0056	<0.011	<0.0056	0.021	<0.056
Geometric Mean		2.1	44	80	--	--	--	--	--
SP-1A,B,C,D	3/10/2005	<1.1[6]	36	120	<0.0057	<0.0057	<0.0057	<0.0057	<0.057
SP-1E,F,G,H	3/10/2005	6.3	66	140	<0.0058	<0.0058	<0.0058	<0.0058	<0.058
Geometric Mean[7]		2.6	49	130	--	--	--	--	--
Arithmetic Mean[7]		3.7	51	130	--	--	--	--	--
%Reduction (GM)		63%	6%	-59%	--	--	--	--	--
%Reduction (AM)		88%	67%	-18%	--	--	--	--	--

1. ug/g: micrograms per gram.
2. TPHG: Total Petroleum Hydrocarbons as Gasoline, analyzed in general accordance with EPA Method 5035/GCFID(LUFT)/EPA8015B.
3. Total Petroleum Hydrocarbons as Diesel (TPHD) and as Motor Oil (TPHMO) analyzed in general accordance with EPA Method No. 3550/GCFID (LUFT)/EPA 8015B.
4. Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X), and Methyl Tertiary-Butyl Ether (MTBE) analyzed using EPA Method No. 5035/8021B.
5. <: denotes a value that is "less than" the method detection limit.
6. Used a value of 1.1 for calculating the geometric and arithmetic mean
7. March 2005 samples

4.0 Discussion and Recommendations

The results of this quarterly monitoring program indicate that groundwater at the corporation yard site has been impacted by petroleum hydrocarbons and fuel oxygenates. The groundwater extraction and treatment system was activated May 17, 2004. Because of seasonal low levels of

groundwater the system has not been operating continuously. SHN is recommending that the system be shut down and replaced with an air sparging system. SHN will conduct an air sparge pilot test using the existing groundwater extraction piping located at the base of the October 2001 excavation pit.

Based on the reduction of TPHG and TPHD concentrations in the biopile soil, SHN is recommending closure for the biopile. The City of Arcata would like to use the treated soil in the construction of dikes for the proposed McDaniel Slough rehabilitation project. The treated soil would be placed in the center of a dike, and encapsulated with bay mud that will be excavated to deepen channels at the site. Prior to closure, SHN will collect four samples for every 100 cubic yards of soil and the analytical laboratory will composite each set of four samples into one for analysis. Using the approximate 1,000 cubic yard volume of the biopile, 10-four point composite samples will be analyzed. Soil samples will be analyzed for TPHMO, TPHD, TPHG, BTEX, and MTBE.

5.0 References

SHN Consulting Engineers & Geologists, Inc. (March 2004). ***Remedial Action Implementation Report (RAIR), Biopile Soil Remediation, City of Arcata Corporation Yard, 600 South G Street, Arcata, California.*** Eureka: SHN

Appendix A

Field Notes

Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician:	Date:	Time:
JCT	1-31-2005	1350

Weather Conditions:	Ambient Air Temperature:
Sun / Clear	58° F

Time Settings Before Adjustments:	Time Settings After Adjustments:
Blower "A": ON from 8am to 4 PM	Blower "A": ON from _____ to _____
Blower "B": ON from 8am to 4 PM	Blower "B": ON from _____ to _____

Blower "A" Manifold Readings:		Blower "B" Manifold Readings:	
Line Temperature:	62 °F	Line Temperature:	61 °F
Line Pressure:	3.7 in-H_2O	Line Pressure:	2.6 in-H_2O
Air Velocity (Line 1)	1964 ft/min	Air Velocity (Line 3)	2331 ft/min
Air Velocity (Line 2)	2841 ft/min	Air Velocity (Line 4)	2559 ft/min

Soil Vapor Readings:	Gas Meter Used:	Gas Meter Calibration:

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Soil Temperature Readings:

#1	#2	#3	#4
60 °F	52 °F	53 °F	68 °F

Condition of Bio-Pile Cover: Good

Condition of Cover Hold-Downs: Good

Additional Observations: over 50% of the tires being used to secure the cover have been replaced by sand bags

Monthly Monitoring
City of Arcata, Corp Yard
000108.100

	Date:	Time:
DCI	2/11/05	1210

Ambient Air Temperature: 58°

Clear

ore Adjustments:

from_____ to_____

from_____ to_____

Time Settings After Adjustments:

Blower "A": ON from_____ to_____

Blower "B": ON from_____ to_____

anifold Readings:	Blower "B" Manifold Readings:
ure: °F	Line Temperature: °F
in-H_2O	Line Pressure: in-H_2O

(Line 1)	Air Velocity (Line 2)	Air Velocity (Line 3)	Air Velocity (Line 4)
ft/min	2160 ft/min	2400 ft/min	2515 ft/min

Readings:

Gas Meter Used:

Gas Meter Calibration:

ple Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Temperature Readings:

#1	#2	#3	#4
60 °F	50 °F	50 °F	68 °F

ondition of Bio-Pile Cover: Good

Condition of Cover Hold-Downs: Good

Additional Observations: Pump + treat system 176 hr. 10917.84 cubic ft.

Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician:	Date:	Time:
A. Melody	3-10-05	1100

Weather Conditions: Overcast

Ambient Air Temperature: 56°F

Time Settings Before Adjustments:

Blower "A": ON from 9 to 5

Blower "B": ON from 9 to 5

Time Settings After Adjustments: No adj. made

Blower "A": ON from 9 to 5

Blower "B": ON from 9 to 5

Blower "A" Manifold Readings:		Blower "B" Manifold Readings:	
Line Temperature: 68 °F		Line Temperature: 68 °F	
Line Pressure: ~4 in-H_2O		Line Pressure: ~2.5 in-H_2O	
Air Velocity (Line 1)	Air Velocity (Line 2)	Air Velocity (Line 3)	Air Velocity (Line 4)
~2000 ft/min	~2500 ft/min	~2300 ft/min	~3100 ft/min

Soil Vapor Readings: (1045) Gas Meter Used: GTC02 Gas Meter Calibration: YES

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1	40	20.9	0.0
#2	40	20.9	0.0
#3	60	20.9	0.0
#4	~~60~~ 40	20.9	0.0
#5	~~1300~~ 100	20.9	0.0

Soil Temperature Readings:

#1	#2	#3	#4
60 °F	52 °F	52 °F	70 °F

Condition of Bio-Pile Cover: Good

Condition of Cover Hold-Downs: Good

Additional Observations:

Monthly Monitoring
City of Arcata, Corp Yard
000108.100

Technician: DCT	Date: 2/11/05	Time: 1210
Weather Conditions: Clear	Ambient Air Temperature: 58°	

Time Settings Before Adjustments:	Time Settings After Adjustments:
Blower "A": ON from_____ to_____	Blower "A": ON from_____ to_____
Blower "B": ON from_____ to_____	Blower "B": ON from_____ to_____

Blower "A" Manifold Readings:		Blower "B" Manifold Readings:	
Line Temperature: _____ °F		Line Temperature: _____ °F	
Line Pressure: _____ in-H_2O		Line Pressure: _____ in-H_2O	
Air Velocity (Line 1): 1605 ft/min	Air Velocity (Line 2): 2160 ft/min	Air Velocity (Line 3): 2460 ft/min	Air Velocity (Line 4): 2515 ft/min

Soil Vapor Readings:	Gas Meter Used:	Gas Meter Calibration:

Sample Port	VOC's (ppm)	O_2 (%)	CO_2 (%)
#1			
#2			
#3			
#4			
#5			

Soil Temperature Readings:

#1	#2	#3	#4
60 °F	50 °F	50 °F	68 °F

Condition of Bio-Pile Cover: Good

Condition of Cover Hold-Downs: Good

Additional Observations: Pump & treat system 176 hr. 10917.84 cubic ft.

Monthly Monitoring
Groundwater Pump & Treat
Arcata Corp. Yard
000108.100

Technician:	Date and Time:
Josh Tyler	1415 / 1-31-2005
Bag Filter Inlet Pressure: — psi	Total Water Discharged: 105.69 ft³
Bag Filter Outlet Pressure: — psi	Bag Filter: Cleaned -or- Replaced
Carbon Drum #1 Outlet Pressure: — psi	Power Draw: — amps
Carbon Drum #2 Outlet Pressure: — psi	

Monthly Operation and Maintenance Items:

- ☑ Record Line Pressures (4 Places).
- ☑ Record Total Water Discharged.
- ☐ Clean or Replace Bag Filter.
- ☑ Record Power Draw of Pump.
- ☐ Collect Samples (Pump Outlet, Carbon Drum #1 Outlet, and Carbon Drum #2 Outlet) Label Samples "INF", "MIDCAR", and "EFF".

Comments and Observations: System Not operating.

Vcedes - Last Total Hours 157.5 hrs

SHN CONSULTING ENGINEERS & GEOLOGISTS, INC.
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DAILY FIELD REPORT

Job No. 000108.100

Page 1 of

Project Name: City of Arcata Biopile	Client/Owner: City of Arcata	Daily Field Report Sequence No:	
General Location Of Work: Arcata, Ca.	Owner/Client Representative: Kim Watson	Date: 1-31-2005	Day Of Week: Mon.
General Contractor: —	Grading Contractor: —	Project Engineer: Mike Foget	
Type Of Work: Monthly Monitoring	Grading Contractor, Superintendent, Or Foreman:	Supervisor: Chris Fisher	
Source & Description Of Fill Material:	Weather: Clear/SUN	Technician: JCT	
	Key Persons Contacted (Civil Engr, Architect, Developer, Etc):		

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting

1350 ON Site / Begin taking Biopile / Pump : Treat Readings
1430 OFF Site

	Copy given to:	Reported By:

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DAILY FIELD REPORT

Job No. 000108.100

Page of

Daily Field Report Sequence No

Project Name: Arcata Corp Yard

Client/Owner: City of Arcata

Owner/Client Representative:

General Location Of Work:

Date: 2/11/05

Day Of Week: Fri

Project Engineer: Mike Foget

General Contractor:

Grading Contractor:

Supervisor:

Type Of Work:

Grading Contractor, Superintendent, Or Foreman:

Technician: Dustin Tibbets

Source & Description Of Fill Material:

Weather: Clear

Key Persons Contacted (Civil Engr, Architect, Developer, Etc):

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting:

1210 On site. Taking readings.
1220 Locked in.
1625 Off site.

Copy given to:

Reported By: [signature]

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Daily Field Report

Job No. 000108.100

Page 1 of 1

Project Name: Arcata Corp Yard	Client/Owner	Daily Field Report Sequence No	
General Location Of Work: Arcata, CA	Owner/Client Representative	Date: 3-10-05	Day Of Week: THURS
General Contractor	Grading Contractor	Project Engineer: M. Foget	
Type Of Work: Soil/vapor sampling/system readings	Grading Contractor, Superintendent, Or Foreman	Supervisor: C. Fisher	
Source & Description Of Fill Material	Weather: overcast	Technician: A. Melody	
	Key Persons Contacted (Civil Engr, Architect, Developer, Etc)		

Describe Equipment Used For Hauling, Spreading, Watering, Conditioning, & Compacting

800 - On site, C. Fisher on site, went over site safety & system anatomy, turned system off.

830 - C. Fisher off site, begin soil sampling via hand auger

SP-1A @ 1' 1030
" 1B @ 2' 1020
" 1C @ 3' 1010
" 1D @ 4' 955
" 1E @ 1' 945
" 1F @ 2' 935
" 1G @ 3' 925
" 1H @ 4' 915

1045 - Begin taking soil vapor readings with GTCO2 vapor analyzer (ports 1-5)

1130 - Done w/vapor readings, turned system on.

1200 - Took system readings

1215 - off site

Copy given to: C. Fisher

Reported By: A. D. Melody

CITY OF ARCATA

REC'D FEB 16 2005

FIELD SAMPLING LOG

PROJECT # 00128100
CLIENT City of Arcata
WELL NO. MW-1
TOTAL DEPTH 17.80
DEPTH TO WATER 5.80

DATE 1/19/05
SAMPLER TW / SA
ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 12.00 X(0.16) CASING VOL 1.92X3 = 5.76 gal

DEPTH	TIME	TIME	WATER REMOVED	EC µ	TEMP	pH
		9:25	0			
		9:30	2.0 gal	7,640	13.4 c	6.04
		10:05	2.0 gal	8,580	12.6 c	5.91
		10:15	1.75 gal	8,100	13.0 c	5.98

TOTAL INITIAL WATER VOLUME 5.75 gal

SAMPLING EQUIPMENT Disposable Bailer
SAMPLE TIME
SAMPLE ANALYSIS EPA List 1, TPHD
LABORATORY NCL
REMARKS

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT #	0001C100	DATE	10/19/05
CLIENT	City of Arcata	SAMPLER	FWT JB
WELL NO.	MW-2	ELEVATION	
TOTAL DEPTH	12.35	WATER ELEVATION	
DEPTH TO WATER	9.00		

HT OF WATER COLUMN 9.35 X(0.16) CASING VOL 1.496 X 3 = 4.5 gal

DEPTH	TIME	TIME	WATER REMOVED	EC µ	TEMP	pH
		10:20	0			
		10:25	1.5 gal	6,100	16.6 C	6.54
		10:30	1.5 gal	6,670	16.5 C	6.56
		10:35	1.5 gal	7,920	16.6 C	6.51

TOTAL INITIAL WATER VOLUME 4.5 gal

SAMPLING EQUIPMENT: DISPOSABLE BAILER

SAMPLE TIME

SAMPLE ANALYSIS: 8260 LIST 1 ; TPHD

LABORATORY: N.C.L.

REMARKS

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT # 000100.00
CLIENT City of Arcata
WELL NO. MW-3
TOTAL DEPTH 14.70
DEPTH TO WATER 1.45

DATE 01/19/05
SAMPLER TWK/JG
ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 13.25 X (0.16) CASING VOL 2.12 X 3 = 6.36 gal

DEPTH	TIME	TIME	WATER REMOVED	EC ✓	TEMP	pH
		11 25	0			
		11 30	2.00 g	2,560	13.4 C	6.63
		11 35	2.00	2,330	13.2 C	6.60
		11 40	2.25	2,570	14.7 C	6.58

TOTAL INITIAL WATER VOLUME 6.25

SAMPLING EQUIPMENT DISPOSABLE BAILER
SAMPLE TIME
SAMPLE ANALYSIS 8260 LIST 1, TPHD
LABORATORY NCL
REMARKS

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT # 0001081100
CLIENT City of Arcata
WELL NO. MW-4
TOTAL DEPTH 14.70
DEPTH TO WATER 3.75

DATE 01/19/05
SAMPLER TWH SG
ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 10.95 X(0.16) CASING VOL 1.752 x 3 = 5.25 gal

DEPTH	TIME	TIME	WATER REMOVED	EC P	TEMP	pH
		10:50	0			
		10:52	1.5 gal	5,960	15.1 C	6.28
		10:55	1.75 gal	7,950	15.5 C	6.32
		11:00	1.75 gal	7,920	15.2 C	6.23

TOTAL INITIAL WATER VOLUME 5 gal

SAMPLING EQUIPMENT Disposable Bailer
SAMPLE TIME
SAMPLE ANALYSIS 8260 List 1 ; TPH-D
LABORATORY N.C.L.
REMARKS

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT # 0001616O
CLIENT City of Arcata
WELL NO. MW-5
TOTAL DEPTH 14.65
DEPTH TO WATER 1.41

DATE 01/10/05
SAMPLER TWT
ELEVATION 5.9
WATER ELEVATION

HT OF WATER COLUMN 13.44 X(0.16) CASING VOL 2.150 X 3 = 6.45 gal

DEPTH	TIME	TIME	WATER REMOVED	EC µ	TEMP	pH
		1:10	0			
		1:15	2.0	2,650	15.1 C	6.3
		1:20	2.5	2,572	14.1 C	6.1
		1:25	2.0	2,510	13.8 C	6.26

TOTAL INITIAL WATER VOLUME 6.5 gal

SAMPLING EQUIPMENT
SAMPLE TIME
SAMPLE ANALYSIS
LABORATORY
REMARKS

CITY OF ARCATA

FIELD SAMPLING LOG

PROJECT # 0001C7100
CLIENT City of Arcata
WELL NO. MW-4
TOTAL DEPTH 14.75
DEPTH TO WATER 1.50

DATE 01/10/05
SAMPLER TWF SA
ELEVATION
WATER ELEVATION

HT OF WATER COLUMN 12.95 X(0.16) CASING VOL 2.072 X 3 = 6.21

DEPTH	TIME	TIME	WATER REMOVED	EC µ	TEMP	pH
		11:05	0			
		11:10	2.00	3,126	14.2 C	6.55
		11:15	2.00	3,377	15.5 C	6.47
		11:20	2.00	4,030	16.3 C	7.46

TOTAL INITIAL WATER VOLUME 6 gal

SAMPLING EQUIPMENT Disposable Bailers
SAMPLE TIME
SAMPLE ANALYSIS 8260, List 1, TPHD
LABORATORY O.C.L.
REMARKS

DATE	TIME	START	FINISH	TOTAL HRS	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MNS START	LEVEL MNS FINISH	CARTRIDGE CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM#1	DRUM#2		METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.	NOTES
31			1575	259												105.69	6.53	
30																		
29																		
28																		
27																		
26	[illegible]		1316			4.1		4.3	✓							99.16		
25																		
24	8.30		1316	9.1												99.16	3.82	
23																		
22																		
21	19:30	1225													95 34		9.61	
20	[illegible]	988																
19															186.73			
18																		
17																		
16																		
15																		
14																		
13																		
12	[illegible]		987			9		[illegible]								86.72		
11																		
10																		
9																		
8																		
7																		
6																		
5	[illegible]		987	-		3.41		3.12								86 72		
4																		
3	[illegible]		987													86.72		
2																		
1																		

YEAR 2005

MONTH FEB YEAR 2005

DATE	TIME	START	FINISH	TOTAL HRS	WELL LEVEL START	WELL LEVEL FINISH	LEVEL MINS START	LEVEL MINS FINISH	CHARGE CHANGE	PRESSURE READINGS OUTLETS BAG FILT IN	BAG FILT OUT	DRUM#1	DRUM#2	METER READINGS START	METER READINGS FINISH	TOTAL CUBIC FT.
31																
30																
29																
28			3478						CHARGE							
27																
26																
25																
24																
23	5:30	3030				5.53		5.45						116 38		
22	7:30	2780												115 92		
21																
20																
19																
18																
17																
16	7:30		191.9	24.9		4.70		4.90							111 51	4.08
15																
14																
13																
12																
11																
10																
9	8:00		16.7	9.5		4.26		4.41							107 43	1.74
8																
7																
6																
5																
4																
3																
2	8:30		1573			4.74		4.95							105.69	
1																

NOTES

CHANGED BAG FILTER RUSSEN WITH SEDIMENT

FIXED SUCTION LEAKS

MONTH MARCH YEAR 2005

DATE	TIME	START	FINISH	HRS	START	FINISH	START	FINISH	CHANGE	OUTLETS BAG FILT IN	BAG FILT OUT	DRUM#1	DRUM#2	START	FINISH	TOTAL CUBIC FT.	NOTES
31																	
30																	
29																	
28																	
27			OFF	LINE –		NO	PUMPING	–		PLUMBING	AIR –						
26																	
25																	
24					1.90												- CHANGED FILTER
23	930	6255			~~201~~		201							127.09			BAG FILTER PUMPING OUT SILT
22																	
21																	
20																	
19																	
18																	
17																	
16	[illegible]	5045			457		477							123.79			
15																	
14																	
13																	
12																	
11																	
10																	
9	[illegible]	4764			492		5.11							122.70			
8																	
7																	
6																	
5																	
4	[illegible]	4166			545		565							120.24			
3																	
2	8:30	3932			523		544							11947			
1																	

Appendix B

Historic Monitoring Data

Table B-1
Historical Groundwater Elevations
City of Arcata Corporation Yard, Arcata, CA

Sample Location	Sample Date	Elevation[1] (feet MSL)[2]	Depth to Water (feet)[3]	Elevation (feet MSL)
MW-1	9/26/2002	8.73	7.73	1.00
	1/22/2003		5.79	2.94
	4/23/2003		5.33	3.40
	7/23/2003		6.60	2.13
	10/22/2003		7.34	1.39
	1/21/2004		3.90	4.83
	4/21/2004		3.81	4.92
	7/21/2004		5.72	3.01
	10/7/2004		7.33	1.40
	1/19/2005		5.80	2.93
MW-2	9/27/2002	9.86	8.82	1.04
	1/22/2003		6.44	3.42
	4/23/2003		9.38	0.48
	7/23/2003		8.90	0.96
	10/22/2003		8.70	1.16
	1/21/2004		7.38	2.48
	4/21/2004		9.53	0.33
	7/21/2004		8.10	1.76
	10/7/2004		8.76	1.10
	1/19/2005		9.00	0.86
MW-3	9/26/2002	6.97	2.84	4.13
	1/22/2003		1.36	5.61
	4/23/2003		1.11	5.86
	7/23/2003		2.50	4.47
	10/22/2003		2.81	4.16
	1/21/2004		3.27	3.70
	4/21/2004		1.00	5.97
	7/21/2004		2.95	4.02
	10/7/2004		3.59	3.38
	1/19/2005		1.45	5.52
MW-4	9/27/2002	6.96	4.01	2.95
	1/22/2003		2.36	4.60
	4/23/2003		2.35	4.61
	7/23/2003		2.50	4.46
	10/22/2003		4.34	2.62
	1/21/2004		1.26	5.70
	4/21/2004		3.67	3.29
	7/21/2004		5.20	1.76
	10/7/2004		4.15	2.81
	1/19/2005		3.75	3.21
MW-5	9/26/2002	6.83	2.70	4.13
	1/22/2003		1.24	5.59
	4/23/2003		1.05	5.78
	7/23/2003		2.30	4.53
	10/22/2003		2.68	4.15
	1/21/2004		1.18	5.65
	4/21/2004		0.50	6.33
	7/21/2004		3.80	3.03
	10/7/2004		2.95	3.88
	1/19/2005		1.41	5.42
MW-6	9/27/2002	6.73	5.11	1.62
	1/22/2003		3.23	3.50
	4/23/2003		1.91	4.82
	7/23/2003		5.60	1.13
	10/22/2003		3.75	2.98
	1/21/2004		1.71	5.02
	4/21/2004		5.65	1.08
	7/21/2004		2.70	4.03
	10/7/2004		3.16	3.57
	1/19/2005		1.80	4.93

1. Top of casing elevation referenced to City of Arcata Bench Mark #4, elevation
2. Mean Sea Level (MSL).
3. Below Top of Casing

Table B-2
Historical Groundwater Analytical Results
City of Arcata Corporation Yard, Arcata, CA
(in ug/L)[1]

Sample Location	Date	TPHD[2]	TPHG[3]	B[3]	T[3]	E[3]	X[3]	MTBE[3]	TBA[3]	DIPE[3]	ETBE[3]	TAME[3]
MW-1	9/26/2002	<50[4]	<50	<0.50	<0.50	<0.50	<0.50	4.3	<20	<1.0	<1.0	<1.0
	1/22/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	34	<20	<1.0	<1.0	1.3
	4/23/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	21	<20	<1.0	<1.0	1.1
	7/23/2003	<50	76	<0.50	<0.50	<0.50	<0.50	100	<20	<1.0	<1.0	4.4
	10/22/2003	<50	75	<0.50	<0.50	<0.50	<0.50	35	<20	<1.0	<1.0	1.6
	1/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	5	<20	<1.0	<1.0	<1.0
	4/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	9.1	<10	<1.0	<1.0	<1.0
	7/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	31	<10	<1.0	<1.0	1.1
	10/7/2004	<50	<50	<0.50	<0.50	<0.50	<1.0	20	<10	<1.0	<1.0	<1.0
	1/19/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	4.6	<10	<1.0	<1.0	<1.0
MW-2	9/27/2002	820	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<20	<1.0	<1.0	<1.0
	1/22/2003	<50	72	<0.50	<0.50	<0.50	<0.50	130	<20	<1.0	<1.0	9.8
	4/23/2003	<50	<50	<0.50	<0.50	<0.50	<0.50	57	<20	<1.0	<1.0	3.5
	7/23/2003	<50	52	<0.50	<0.50	<0.50	<0.50	59	<20	<1.0	<1.0	3.4
	10/22/2003	<50	64	<0.50	<0.50	<0.50	<0.50	37	<20	<1.0	<1.0	2.2
	1/21/2004	<50	83	<0.50	<0.50	<0.50	<0.50	61	<20	<1.0	<1.0	3.8
	4/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	22	<10	<1.0	<1.0	1.5
	7/21/2004	<50	<50	<0.50	<0.50	<0.50	<0.50	24	<10	<1.0	<1.0	1.5
	10/7/2004	<50	<50	<0.50	<0.50	<0.50	<1.0	26	<10	<1.0	<1.0	1.5
	1/19/2005	<50	<50	<0.50	<0.50	<0.50	<1.0	33	<10	<1.0	<1.0	1.7
MW-3	9/26/2002	<50	990	63	<0.50	<0.50	<0.50	860	58	<1.0	<1.0	55
	1/22/2003	220	1,600	110	13	41	50.9	990	250	<1.0	<1.0	75
	4/23/2003	150	660	55	1.1	3	1.5	720	82	<1.0	<1.0	48
	7/23/2003	83	210	120	<0.50	<0.50	<0.50	530	94	<1.0	<1.0	11
	10/22/2003	330	720	26	<0.50	<0.50	<0.50	570	32	<1.0	<1.0	32
	1/21/2004	78	740	58	5.7	17	8.2	310	<90	<1.0	<1.0	25
	4/21/2004	<50	360	77	1.4	1.7	0.88	120	<28	<1.0	<1.0	7.2
	7/21/2004	130	260	<0.50	<0.50	<0.50	<0.50	280	43	<1.0	<1.0	9.7
	10/7/2004	57	640	1.6	<0.50	<0.50	<1.0	450	64	<1.0	<1.0	28
	1/19/2005	<50	120	1.5	<0.50	<0.50	<1.0	110	<45	<1.0	<1.0	4.0
MW-4	9/27/2002	<50	270	<0.50	<0.50	<0.50	<0.50	270	32	<1.0	<1.0	6.2
	1/22/2003	150	250	<0.50	<0.50	<0.50	<0.50	340	170	<1.0	<1.0	13
	4/23/2003	110	520	<0.50	<0.50	<0.50	<0.50	350	160	<1.0	<1.0	11
	7/23/2003	<50	1,000	160	3	0.78	4.1	330	66	<1.0	<1.0	41
	10/22/2003	130	290	<0.50	<0.50	<0.50	<0.50	260	62	<1.0	<1.0	6.5
	1/21/2004	97	550	<0.50	<0.50	<0.50	<0.50	580	190	<1.0	<1.0	16
	4/21/2004	<50	480	<0.50	<0.50	<0.50	<0.50	490	130	<1.0	<1.0	15
	7/21/2004	140	380	25	<0.50	<0.50	<0.50	500	29	<1.0	<1.0	22
	10/7/2004	<50	440	<0.50	<0.50	<0.50	<1.0	380	110	<1.0	<1.0	8.5
	1/19/2005	<50	410	<0.50	<0.50	<0.50	<1.0	380	<10	<1.0	<1.0	12
MW-5	9/26/2002	160	750	<0.50	<0.50	<0.50	<0.50	490	66	<1.0	<1.0	12
	1/22/2003	1,300	590	<0.50	0.87	<0.50	<0.50	330	160	<1.0	<1.0	13
	4/23/2003	1,100	520	<0.50	<0.50	<0.50	<0.50	280	56	<1.0	<1.0	8.1
	7/23/2003	930	150	<0.50	<0.50	<0.50	<0.50	300	35	<1.0	<1.0	6.2
	10/22/2003	3,400	780	<0.50	<0.50	<0.50	<0.50	320	41	<1.0	<1.0	7.7
	1/21/2004	810	610	<0.50	<0.50	<0.50	<0.50	300	<120	<1.0	<1.0	8.2
	4/21/2004	180	430	<0.50	<0.50	<0.50	<0.50	200	<60	<1.0	<1.0	6.2
	7/21/2004	50	320	<0.50	<0.50	<0.50	<0.50	420	110	<1.0	<1.0	12
	10/7/2004	610	780	<0.50	<0.50	<0.50	<1.0	290	57	<1.0	<1.0	7.2
	1/19/2005	440	530	<0.50	<0.50	<0.50	<1.0	240	<90	<1.0	<1.0	6.0
MW-6	9/27/2002	78	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<20	<1.0	<1.0	<1.0
	1/22/2003	280	170	<0.50	<0.50	<0.50	<0.50	250	55	<1.0	<1.0	5.5
	4/23/2003	320	250	<0.50	<0.50	<0.50	<0.50	290	45	<1.0	<1.0	7.9
	7/23/2003	<50	510	<0.50	<0.50	<0.50	0.55	190	38	<1.0	<1.0	7.7
	10/22/2003	290	340	0.83	<0.50	<0.50	<0.50	290	36	<1.0	<1.0	7
	1/21/2004	290	310	<0.50	<0.50	<0.50	<0.50	270	<120	<1.0	<1.0	7.6
	4/21/2004	<50	290	0.67	<0.50	<0.50	<0.50	260	43	<1.0	<1.0	7.7
	7/21/2004	1,000	470	<0.50	<0.50	<0.50	<0.50	350	39	<1.0	<1.0	7.0
	10/7/2004	110	260	<0.50	<0.50	<0.50	<1.0	210	<80	<1.0	<1.0	5.7
	1/19/2005	81	170	<0.50	<0.50	<0.50	<1.0	130	46	<1.0	<1.0	4.1

1. ug/L: micrograms per Liter
2. TPHD: Total Petroleum Hydrocarbons as Diesel, analyzed in general accordance with EPA Method 3510/GCFID.
3. TPHG: Total Petroleum Hydrocarbons as Gasoline, Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X), Methyl Tertiary-ButylEther (MTBE), Tertiary-Butyl Alcohol (TBA), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), Tertiary-Amyl Butyl Ether (TAME), analyzed in general accordance with EPA Method 8260B.
4. <: Denotes a laboratory values less than the method detection limit.

Appendix C

Laboratory Analytical Reports

NORTH COAST LABORATORIES LTD.

REC'D FEB 07 2005

February 02, 2005

City of Arcata
736 F Street
Arcata, CA 95521-6211

Attn: Kim Watson

RE: 000108100, Arcata Corp. Yard

Order No.: 0501395
Invoice No.: 47921
PO No.: 8910
ELAP No. 1247-Expires July 2006

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	MW-1
01B	MW-1
02A	MW-2
02B	MW-2
03A	MW-4
03B	MW-4
04A	MW-6
04B	MW-6
05A	MW-3
05B	MW-3
05A	MW-5
05B	MW-5

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

North Coast Laboratories, Ltd. Date: *03-Feb-05*

CLIENT: City of Arcata
Project: 000108100, Arcata Corp. Yard
Lab Order: 0501395

CASE NARRATIVE

All samples submitted for a silica gel cleanup were initially analyzed for diesel. The samples showing no detectable levels of the analyte were not subjected to the cleanup procedure.

TPH as Diesel with Silica Gel Cleanup:
Samples MW-6 and MW-5 contain material similar to degraded or weathered diesel oil.

Gasoline Components/Additives:
The gasoline value for sample MW-5 includes the reported gasoline additives in addition to other peaks in the gasoline range.

The gasoline values for samples MW-4, MW-6 and MW-3 are primarily from the reported gasoline additives.

Some reporting limits were raised for samples MW-3 and MW-5 due to matrix interference.

The surrogate recoveries were below the lower acceptance limit for samples MW-1, MW-3 and the method blank. The response of the reporting limit standard was such that the analytes would have been detected even with the low recoveries; therefore, the data were accepted.

TPH as Diesel:
The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries were above the upper acceptance limit for the surrogate. The LCS/LCSD recoveries for diesel were within the acceptance limits; therefore, the data were accepted.

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-1 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-01A

Test Name: TPH as Diesel **Reference:** EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	1/27/05	1/28/05
Surrogate: N-Tricosane	97.8	27.6-107	% Rec	1.0	1/27/05	1/28/05

Client Sample ID: MW-1 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-01B

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	4.6	1.0	µg/L	1.0		1/25/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	ND	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	75.2	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		1/25/05

Client Sample ID: MW-2 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-02A

Test Name: TPH as Diesel **Reference:** EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	1/27/05	1/28/05
Surrogate: N-Tricosane	92.3	27.6-107	% Rec	1.0	1/27/05	1/28/05

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-2 Received: 1/19/05 Collected: 1/19/05 0:00
Lab ID: 0501395-02B

Test Name: Gasoline Components/Additives Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	33	1.0	µg/L	1.0		1/25/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	ND	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	1.7	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	81.2	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline Reference: LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		1/25/05

Client Sample ID: MW-4 Received: 1/19/05 Collected: 1/19/05 0:00
Lab ID: 0501395-03A

Test Name: TPH as Diesel Reference: EPA 3510/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	1/27/05	1/28/05
Surrogate: N-Tricosane	95.5	27.6-107	% Rec	1.0	1/27/05	1/28/05

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-4 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-03B

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	380	50	µg/L	50		1/24/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	ND	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	12	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	82.8	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	410	50	µg/L	1.0		1/25/05

Client Sample ID: MW-6 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-04A

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	81	50	µg/L	1.0	1/30/05	2/1/05
Surrogate: N-Tricosane	90.6	34-145	% Rec	1.0	1/30/05	2/1/05

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-6 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-04B

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	130	50	µg/L	50		1/24/05
Tert-butyl alcohol (TBA)	46	10	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	ND	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	4.1	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	82.2	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	170	50	µg/L	1.0		1/25/05

Client Sample ID: MW-3 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-05A

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	1/30/05	2/1/05
Surrogate: N-Tricosane	95.1	34-145	% Rec	1.0	1/30/05	2/1/05

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-3 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-05B

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	110	50	µg/L	50		1/24/05
Tert-butyl alcohol (TBA)	ND	45	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	1.5	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	4.0	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	78.0	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	120	50	µg/L	1.0		1/25/05

Client Sample ID: MW-5 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-06A

Test Name: TPH as Diesel with Silica Gel Cleanup **Reference:** EPA 3510/3630/GCFID(LUFT)/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	440	50	µg/L	1.0	1/30/05	2/1/05
Surrogate: N-Tricosane	95.2	34-145	% Rec	1.0	1/30/05	2/1/05

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Date: 02-Feb-05
WorkOrder: 0501395

ANALYTICAL REPORT

Client Sample ID: MW-5 **Received:** 1/19/05 **Collected:** 1/19/05 0:00
Lab ID: 0501395-06B

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	240	50	µg/L	50		1/24/05
Tert-butyl alcohol (TBA)	ND	90	µg/L	1.0		1/25/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		1/25/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		1/25/05
Benzene	ND	0.50	µg/L	1.0		1/25/05
Tert-amyl methyl ether (TAME)	6.0	1.0	µg/L	1.0		1/25/05
Toluene	ND	0.50	µg/L	1.0		1/25/05
Ethylbenzene	ND	0.50	µg/L	1.0		1/25/05
m,p-Xylene	ND	0.50	µg/L	1.0		1/25/05
o-Xylene	ND	0.50	µg/L	1.0		1/25/05
Surrogate: 1,4-Dichlorobenzene-d4	95.8	80.8-139	% Rec	1.0		1/25/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	530	50	µg/L	1.0		1/25/05

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North Coast Laboratories, Ltd.

Date: 02-Feb-05

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT

Method Blank

Sample ID: **MB 012405** Batch ID: **R33013** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **1/24/05 6:32:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124A** SeqNo: **478576**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Tert-butyl alcohol (TBA)	ND	10									
Di-isopropyl ether (DIPE)	ND	1.0									
Ethyl tert-butyl ether (ETBE)	ND	1.0									
Benzene	ND	0.50									
Tert-amyl methyl ether (TAME)	ND	1.0									
Toluene	0.08052	0.50									J
Ethylbenzene	0.1327	0.50									J
m,p-Xylene	ND	0.50									
o-Xylene	ND	0.50									
1,4-Dichlorobenzene-d4	0.777	0.10	1.00	0	77.7%	81	139	0			S

Sample ID: **MB 012405** Batch ID: **R33014** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **1/24/05 6:32:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124B** SeqNo: **478607**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	ND	50									

Sample ID: **MB-12879** Batch ID: **12879** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **2/1/05 7:56:53 PM** Prep Date: **1/30/05**
Client ID: Run ID: **ORGC5_050201A** SeqNo: **480367**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	ND	50									
N-Tricosane	51.7	0.10	50.0	0	103%	34	145	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-12866** Batch ID: **12866** Test Code: **TPHDIW** Units: **µg/L** Analysis Date: **1/28/05 12:23:46 AM** Prep Date: **1/27/05**

Client ID: Run ID: **ORGC7_050127B** SeqNo: **479373**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	ND	50									
N-Tricosane	45.7	0.10	50.0	0	91.3%	28	107	0			

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 02-Feb-05

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS-05052** Batch ID: **R33013** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **1/24/05 2:31:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124A** SeqNo: **478573**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.64	1.0	20.0	0	88.2%	80	120	0			
Tert-butyl alcohol (TBA)	556.2	10	400	0	139%	25	162	0			
Di-isopropyl ether (DIPE)	16.92	1.0	20.0	0	84.6%	80	120	0			
Ethyl tert-butyl ether (ETBE)	20.42	1.0	20.0	0	102%	77	120	0			
Benzene	17.15	0.50	20.0	0	85.8%	78	117	0			
Tert-amyl methyl ether (TAME)	18.17	1.0	20.0	0	90.8%	64	136	0			
Toluene	16.31	0.50	20.0	0	81.5%	80	120	0			
Ethylbenzene	17.77	0.50	20.0	0	88.9%	80	120	0			
m,p-Xylene	35.23	0.50	40.0	0	88.1%	80	120	0			
o-Xylene	17.38	0.50	20.0	0	86.9%	80	120	0			
1,4-Dichlorobenzene-d4	1.04	0.10	1.00	0	104%	81	139	0			

Sample ID: **LCSD-05052** Batch ID: **R33013** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **1/24/05 3:01:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124A** SeqNo: **478574**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.71	1.0	20.0	0	88.6%	80	120	17.6	0.405%	20	
Tert-butyl alcohol (TBA)	483.1	10	400	0	121%	25	162	556	14.1%	20	
Di-isopropyl ether (DIPE)	16.88	1.0	20.0	0	84.4%	80	120	16.9	0.253%	20	
Ethyl tert-butyl ether (ETBE)	20.60	1.0	20.0	0	103%	77	120	20.4	0.864%	20	
Benzene	17.01	0.50	20.0	0	85.1%	78	117	17.2	0.828%	20	
Tert-amyl methyl ether (TAME)	18.36	1.0	20.0	0	91.8%	64	136	18.2	1.05%	20	
Toluene	16.21	0.50	20.0	0	81.0%	80	120	16.3	0.618%	20	
Ethylbenzene	17.50	0.50	20.0	0	87.5%	80	120	17.8	1.54%	20	
m,p-Xylene	35.04	0.50	40.0	0	87.6%	80	120	35.2	0.530%	20	
o-Xylene	17.45	0.50	20.0	0	87.3%	80	120	17.4	0.436%	20	
1,4-Dichlorobenzene-d4	1.01	0.10	1.00	0	101%	81	139	1.04	3.32%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 02-Feb-05

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05052** Batch ID: **R33013** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **1/24/05 2:31:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050124A** SeqNo: **478573**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.64	1.0	20.0	0	88.2%	80	120	0			
Tert-butyl alcohol (TBA)	556.2	10	400	0	139%	25	162	0			
Di-isopropyl ether (DIPE)	16.92	1.0	20.0	0	84.6%	80	120	0			
Ethyl tert-butyl ether (ETBE)	20.42	1.0	20.0	0	102%	77	120	0			
Benzene	17.15	0.50	20.0	0	85.8%	78	117	0			
Tert-amyl methyl ether (TAME)	18.17	1.0	20.0	0	90.8%	64	136	0			
Toluene	16.31	0.50	20.0	0	81.5%	80	120	0			
Ethylbenzene	17.77	0.50	20.0	0	88.9%	80	120	0			
m,p-Xylene	35.23	0.50	40.0	0	88.1%	80	120	0			
o-Xylene	17.38	0.50	20.0	0	86.9%	80	120	0			
1,4-Dichlorobenzene-d4	1.04	0.10	1.00	0	104%	81	139	0			

Sample ID: **LCSD-05052** Batch ID: **R33013** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **1/24/05 3:01:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS2_050124A** SeqNo: **478574**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.71	1.0	20.0	0	88.6%	80	120	17.6	0.405%	20	
Tert-butyl alcohol (TBA)	483.1	10	400	0	121%	25	162	556	14.1%	20	
Di-isopropyl ether (DIPE)	16.88	1.0	20.0	0	84.4%	80	120	16.9	0.253%	20	
Ethyl tert-butyl ether (ETBE)	20.60	1.0	20.0	0	103%	77	120	20.4	0.864%	20	
Benzene	17.01	0.50	20.0	0	85.1%	78	117	17.2	0.828%	20	
Tert-amyl methyl ether (TAME)	18.36	1.0	20.0	0	91.8%	64	136	18.2	1.05%	20	
Toluene	16.21	0.50	20.0	0	81.0%	80	120	16.3	0.618%	20	
Ethylbenzene	17.50	0.50	20.0	0	87.5%	80	120	17.8	1.54%	20	
m,p-Xylene	35.04	0.50	40.0	0	87.6%	80	120	35.2	0.530%	20	
o-Xylene	17.45	0.50	20.0	0	87.3%	80	120	17.4	0.436%	20	
1,4-Dichlorobenzene-d4	1.01	0.10	1.00	0	101%	81	139	1.04	3.32%	20	

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS-05053** Batch ID: **R33014** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **1/24/05 4:32:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124B** SeqNo: **478604**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	936.8	50	1,000	0	93.7%	80	120	0			

Sample ID: **LCSD-05053** Batch ID: **R33014** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **1/24/05 5:02:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS2_050124B** SeqNo: **478605**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	907.5	50	1,000	0	90.7%	80	120	937	3.18%	20	

Sample ID: **LCS-12879** Batch ID: **12879** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **2/1/05 6:04:12 PM** Prep Date: **1/30/05**
Client ID: Run ID: **ORGC5_050201A** SeqNo: **480365**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	361.3	50	500	0	72.3%	33	92	0			
N-Tricosane	56.7	0.10	50.0	0	113%	34	145	0			

Sample ID: **LCSD-12879** Batch ID: **12879** Test Code: **SGTPHDW** Units: **µg/L** Analysis Date: **2/1/05 6:32:07 PM** Prep Date: **1/30/05**
Client ID: Run ID: **ORGC5_050201A** SeqNo: **480366**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	343.1	50	500	0	68.6%	33	92	361	5.19%	13	
N-Tricosane	54.6	0.10	50.0	0	109%	34	145	56.7	3.90%	11	

Sample ID: **LCS-12866** Batch ID: **12866** Test Code: **TPHDIW** Units: **µg/L** Analysis Date: **1/27/05 10:49:40 PM** Prep Date: **1/27/05**
Client ID: Run ID: **ORGC7_050127B** SeqNo: **479370**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	427.2	50	500	0	85.4%	80	120	0			
N-Tricosane	56.1	0.10	50.0	0	112%	28	107	0			S

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: City of Arcata
Work Order: 0501395
Project: 000108100, Arcata Corp. Yard

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-12866** Batch ID: **12866** Test Code: **TPHDIW** Units: µg/L Analysis Date: **1/27/05 11:08:36 PM** Prep Date: **1/27/05**
Client ID: Run ID: **ORGC7_050127B** SeqNo: **479371**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	486.7	50	500	0	97.3%	80	120	427	13.0%	15	
N-Tricosane	57.8	0.10	50.0	0	116%	28	107	56.1	3.08%	15	S

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

NORTH COAST LABORATORIES LTD.
5680 West End Road · Arcata · CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: [illegible]

Attention: Kim Watson
Results & Invoice to: City of Arcata
Address: 736 F. Street
Arcata CA 95521
Phone: 825-2180
Copies of Report to: SHN - Mike Foget
812 W. Wabash Ave. Eureka
Sampler (Sign & Print): [signature] Tom Wiseman

PROJECT INFORMATION

Project Number: 000106100
Project Name: Arcata Corp. Yard
Purchase Order Number:

	Analysis 1	Analysis 2
PRESERVATIVE	—	a
CONTAINER	4	9
ANALYSIS	TPH diesel/motor oil [illegible]	[illegible]

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	Analysis 1	Analysis 2
	MW-1	01/19/05	AM	G.W	X	X
	MW-2	↓	↓	↓	X	X
	MW-4	↓	↓	↓	X	X
	MW-6	↓	↓	↓	X	X
	MW-3	↓	↓	↓	X	X
	MW-5	↓	↓	↓	X	X

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☑ STD (2–3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☐ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

[illegible]
4.1C

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
[signature] Tom Wiseman	01/19/05	[signature]	1/19/05 1555

SAMPLE DISPOSAL
☑ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

Alpha Analytical Laboratories Inc.
208 Mason St. Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

25 March 2005

North Coast Labs, Inc.
Attn: Loretta or Laura
5680 West End Road
Arcata, CA 95521
RE: 0503261
Work Order: A503424

Enclosed are the results of analyses for samples received by the laboratory on 03/11/05 16:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nena M. Burgess For Sheri L. Speaks
Project Manager

Alpha Analytical Laboratories Inc.
208 Mason St. Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

North Coast Labs, Inc.
5680 West End Road
Arcata, CA 95521
Attn: Loretta or Laura

Report Date: 03/25/05 12:47
Project No: 0503261
Project ID: 0503261

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A503424	03/11/2005 16:10	NCL	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
0503261-1D SP-1A@1'/SP-1B@2'/SP-1C	A503424-01	Soil	03/10/05 00:00	03/11/05 16:10
0503261-2D SP-1E@1'/SP-1F@2'/SP-1G	A503424-02	Soil	03/10/05 00:00	03/11/05 16:10

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Nena M. Burgess For Sheri L. Speaks
Project Manager

3/25/2005

Alpha Analytical Laboratories Inc.
208 Mason St. Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

North Coast Labs, Inc.
5680 West End Road
Arcata, CA 95521
Attn: Loretta or Laura

Report Date: 03/25/05 12:47
Project No: 0503261
Project ID: 0503261

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A503424	03/11/2005 16:10	NCL	

Alpha Analytical Laboratories, Inc.

	METHOD	BATCH	PREPARED	ANALYZED	DILUTION	RESULT	PQL	NOTE
0503261-1D SP-1A@1'/SP-1B@2'/SP-1C (A503424-01)	**Sample Type: Soil**					**Sampled: 03/10/05 00:00**		
Conventional Chemistry Parameters by APHA/EPA Methods								
Total Organic Carbon	EPA 9060	AC52121	03/21/05	03/24/05	1	**13400 mg/kg**	**1.00**	
0503261-2D SP-1E@1'/SP-1F@2'/SP-1G (A503424-02)	**Sample Type: Soil**					**Sampled: 03/10/05 00:00**		
Conventional Chemistry Parameters by APHA/EPA Methods								
Total Organic Carbon	EPA 9060	AC52121	03/21/05	03/24/05	1	**15200 mg/kg**	**1.00**	

Nena M. Burgess For Sheri L. Speaks
Project Manager

3/25/2005

Alpha Analytical Laboratories Inc.
208 Mason St. Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

North Coast Labs, Inc.
5680 West End Road
Arcata, CA 95521
Attn: Loretta or Laura

Report Date: 03/25/05 12:47
Project No: 0503261
Project ID: 0503261

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A503424	03/11/2005 16:10	NCL	

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte(s)	Result	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AC52121 - General Prep										
Blank (AC52121-BLK1)				Prepared: 03/21/05 Analyzed: 03/24/05						
Total Organic Carbon	ND	1.00	mg/kg							
LCS (AC52121-BS1)				Prepared: 03/21/05 Analyzed: 03/24/05						
Total Organic Carbon	7230	1.00	mg/kg	5370		135	60-140			
LCS Dup (AC52121-BSD1)				Prepared: 03/21/05 Analyzed: 03/24/05						
Total Organic Carbon	6860	1.00	mg/kg	5370		128	60-140	5.25	20	
Duplicate (AC52121-DUP1)		Source: A503424-01		Prepared: 03/21/05 Analyzed: 03/24/05						
Total Organic Carbon	12200	1.00	mg/kg		13400			9.38	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Nena M. Burgess For Sheri L. Speaks
Project Manager

3/25/2005

Alpha Analytical Laboratories Inc.
208 Mason St. Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

North Coast Labs, Inc.
5680 West End Road
Arcata, CA 95521
Attn: Loretta or Laura

Report Date: 03/25/05 12:47
Project No: 0503261
Project ID: 0503261

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A503424	03/11/2005 16:10	NCL	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
PQL	Practical Quantitation Limit

3-6

Page 1 of 1

NORTH COAST LABORATORIES LTD.

Sub-Contract
Chain of Custody Record

Date Shipped: 3/11/05 **Carrier:** HAND

Air Bill #: _____ **Cooler #:** _____

Subcontractor: Alpha Analytical - Ukiah
860 Waugh Lane, H-1
Ukiah, CA 95482

Phone: (707) 468-0401
Attention Line: Karen Daly

Send Results to: North Coast Labs
5680 West End Road
Arcata, CA 95521
Attn: Loretta Tomlin
(707) 822-4649

Relinquished By: (signature)	Date/Time 3/11/05 1040	Received By: (signature)	Date/Time 3/11/05 16:10
Relinquished By: (signature) 1610	Date/Time 3/11/05 1610	Received By: (signature)	Date/Time
Relinquished By: (signature)	Date/Time	Received By: (signature)	Date/Time

Analysis Request

NCL Sample #:	Sample ID:	Date Sampled:	Analysis / Matrix:
0503261-1D	SP-1A@1'/SP-1B@2'/SP-1C	3/10/05	TOC/Soil
0503261-2D	SP-1E@1'/SP-1F@2'/SP-1G	3/10/05	TOC SOIL
[redacted]			
[redacted]			

A503424-1
2

Special Instructions: Please include QC Data

Date Due: 3/24/05 Rush Charges Authorized: NO Preservative: None

Return Chain of Custody to NCL

Monarch Laboratory, Inc.

563 East Lindo Avenue • Chico, California 95926
Phone 530 343-5818 • Facsimile 530 343-3807

North Coast Laboratories LTD
5680 West End Road
Arcata, CA 95521

Grower: CITARCCD

Date Submitted: 3/15/05
Date Reported: 3/16/05

FIELD #	OM %	TKN %	C:N RATIO
0503261-01E			
SP-1A-SP-1D	2.4	0.1	24:1
0503261-02E			
SP-1E-SP-1H	3.2	0.2	16:1

Monarch Laboratory, Inc.

563 East Lindo Avenue • Chico, California 95926
Phone 530 343-5818 • Facsimile 530 343-3807

North Coast Laboratories LTD
5680 West End Road
Arcata, CA 95521

Grower: CITARCCD

Date Submitted: 3/15/05
Date Reported: 3/16/05

FIELD #	OM %	TKN %	C:N RATIO
0503261-01E			
SP-1A-SP-1D	2.4	0.1	24:1
0503261-02E			
SP-1E-SP-1H	3.2	0.2	16:1

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: 0503261

Attention: KIM WATSON
Results & Invoice to: City of Arcata
Address: 736 F Street
Arcata, CA 95521
Phone: ~~826~~ 822-5957
Copies of Report to: SHN (Mike Foget)
812 W. Wabash Ave, Eureka, CA 95501
Sampler (Sign & Print): ~~Am~~ D. Tilly Aaron D. Melody

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☒ STD (2–3 Wk) ☐ Other: _____
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☒ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

PROJECT INFORMATION

Project Number: 000108.100
Project Name: Arcata Corp Yard
Purchase Order Number: _____

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	# CONTAINERS	TPHG/BTEX	TPHD/TPHMO	C:N RATIO	Total Nitrogen	Total Org. Carbon	Total Phosphorus	% Moisture	
	SP-1A @ 1'	3-10-05	1030	S	13	X	X	X	X	X	X	X	
	SP-1B @ 2'		1020		13	X	X	X	X	X	X	X	
	SP-1C @ 3'		1010		12	X	X	X	X	X	X	X	
	SP-1D @ 4'		955		12	X	X	X	X	X	X	X	
	SP-1E @ 1'		945		12	X	X	X	X	X	X	X	
	SP-1F @ 2'		935		12	X	X	X	X	X	X	X	
	SP-1G @ 3'		925		12	X	X	X	X	X	X	X	
	SP-1H @ 4'	↓	915	↓	12	X	X	X	X	X	X	X	

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

Lab to composite 1A, 1B, 1C, & 1D into one sample
Lab to composite 1E, 1F, 1G, & 1H into one sample

on ice, intact

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
Am D. Tilly Aaron Melody	3-10-05 1330	K. Thompson	3/10/05 1330

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

RECD APR 0 6 2005

NORTH COAST LABORATORIES LTD.

April 04, 2005

City of Arcata
Dept. of Public Works
736 F Street
Arcata, CA 95521
Attn: Kim Watson

Order No.: 0503261
Invoice No.: 49071
PO No.:
ELAP No. 1247-Expires July 2006

RE: 000108.100, Arcata Corp Yard

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' C
01B	SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' C
01C	SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' C
01D	SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' C
01E	SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' C
02A	SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' C
02B	SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' C
02C	SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' C
02D	SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' C
02E	SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' C

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr.
Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

CLIENT:	City of Arcata
Project:	000108.100, Arcata Corp Yard
Lab Order:	0503261

CASE NARRATIVE

TPH as Gasoline:
Sample SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' COMPOSITE does not present a peak pattern consistent with that of gasoline. The peaks elute towards the end of the gasoline range. In our judgement the material appears to be a product heavier than gasoline. Due to the differences in the purging efficiency of these heavier materials the result may be variable. The reported result represents the amount of material in the gasoline range.

TPH as Diesel/Motor Oil:
Samples SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4' COMPOSITE and SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' COMPOSITE contain material similar to degraded or weathered diesel oil.

Inorganic Organic Analyses:
The extract for Total Phosphate as phosphorus and Total Kjeldahl Nitrogen were prepared from 5.0 grams of sample and 150 mLs of deionized water.

NORTH COAST LABORATORIES
5680 West End Road • Arcata, California 95521-9202 • 707-822-4649 • FAX 707-822-6831

Date: 04-Apr-05
WorkOrder: 0503261

ANALYTICAL REPORT

Client Sample ID: SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4 **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-01A

Test Name: BTEX **Reference:** EPA 5035/EPA 8021B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
MTBE	ND	0.057	µg/g-dry	1.0	3/22/05	3/23/05
Benzene	ND	0.0057	µg/g-dry	1.0	3/22/05	3/23/05
Toluene	ND	0.0057	µg/g-dry	1.0	3/22/05	3/23/05
Ethylbenzene	ND	0.0057	µg/g-dry	1.0	3/22/05	3/23/05
m,p-Xylene	ND	0.0057	µg/g-dry	1.0	3/22/05	3/23/05
o-Xylene	ND	0.0057	µg/g-dry	1.0	3/22/05	3/23/05
Surrogate: Cis-1,2-Dichloroethylene	67.2	71.8-135	% Rec	1.0	3/22/05	3/23/05

Test Name: TPH as Gasoline **Reference:** EPA 5035/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gas (C6-C14)	ND	1.1	µg/g-dry	1.0	3/22/05	3/23/05

Client Sample ID: SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4 **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-01B

Test Name: TPH as Diesel/Motor Oil **Reference:** EPA 3550/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	36	1.1	µg/g-dry	1.0	3/18/05	3/21/05
TPHC Motor Oil	120	11	µg/g-dry	1.0	3/18/05	3/21/05

Client Sample ID: SP-1A@1'/SP-1B@2'/SP-1C@3'/SP-1D@4 **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-01C

Test Name: F, SO4, Cl, NO3, NO2 **Reference:** EPA 300.0 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Nitrate (as Nitrogen)	25	1.1	µg/g-dry	1.0		3/11/05
Nitrite (as Nitrogen)	ND	1.1	µg/g-dry	1.0		3/11/05

Test Name: Percent Moisture **Reference:** Std. Meth. 19th Ed. 2540G Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Percent Moisture	13	0.10	wt%	1.0		3/17/05

Test Name: Total Kjeldahl Nitrogen **Reference:** EPA 351.4 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Total Kjeldahl Nitrogen	1,000	170	µg/g-dry	1.0	3/22/05	3/24/05

Test Name: Total Nitrogen **Reference:** Std. Meth. 19th Ed. 4500-N

Parameter	Result	Limit	Units	DF	Extracted	Analyzed

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ANALYTICAL REPORT

Total Nitrogen	1,000	170	µg/g-dry	1.0	3/25/05

Test Name: Total Phosphate Phosphorus **Reference:** EPA 365.2 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Total Phosphate Phosphorus	11	2.3	µg/g-dry	1.0	3/22/05	3/22/05

Client Sample ID: SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-02A

Test Name: BTEX **Reference:** EPA 5035/EPA 8021B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
MTBE	ND	0.058	µg/g-dry	1.0	3/22/05	3/23/05
Benzene	ND	0.0058	µg/g-dry	1.0	3/22/05	3/23/05
Toluene	ND	0.0058	µg/g-dry	1.0	3/22/05	3/23/05
Ethylbenzene	ND	0.0058	µg/g-dry	1.0	3/22/05	3/23/05
m,p-Xylene	ND	0.0058	µg/g-dry	1.0	3/22/05	3/23/05
o-Xylene	ND	0.0058	µg/g-dry	1.0	3/22/05	3/23/05
Surrogate: Cis-1,2-Dichloroethylene	93.5	71.8-135	% Rec	1.0	3/22/05	3/23/05

Test Name: TPH as Gasoline **Reference:** EPA 5035/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gas (C6-C14)	6.3	1.2	µg/g-dry	1.0	3/22/05	3/23/05

Client Sample ID: SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-02B

Test Name: TPH as Diesel/Motor Oil **Reference:** EPA 3550/GCFID(LUFT)/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	66	1.2	µg/g-dry	1.0	3/18/05	3/21/05
TPHC Motor Oil	140	12	µg/g-dry	1.0	3/18/05	3/21/05

Client Sample ID: SP-1E@1'/SP-1F@2'/SP-1G@3'/SP-1H@4' **Received:** 3/10/05 **Collected:** 3/10/05 0:00
Lab ID: 0503261-02C

Test Name: F, SO4, Cl, NO3, NO2 **Reference:** EPA 300.0 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Nitrate (as Nitrogen)	5.8	1.2	µg/g-dry	1.0		3/11/05
Nitrite (as Nitrogen)	ND	1.2	µg/g-dry	1.0		3/11/05

Test Name: Percent Moisture **Reference:** Std. Meth. 19th Ed. 2540G Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Percent Moisture	14	0.10	wt%	1.0		3/17/05

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Date: 04-Apr-05

WorkOrder: 0503261

ANALYTICAL REPORT

Test Name: Total Kjeldahl Nitrogen — Reference: EPA 351.4 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Total Kjeldahl Nitrogen	1,000	170	µg/g-dry	1.0	3/22/05	3/24/05

Test Name: Total Nitrogen — Reference: Std. Meth. 19th Ed. 4500-N

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Total Nitrogen	1,000	170	µg/g-dry	1.0		3/25/05

Test Name: Total Phosphate Phosphorus — Reference: EPA 365.2 Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Total Phosphate Phosphorus	20	2.3	µg/g-dry	1.0	3/22/05	3/22/05

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North Coast Laboratories, Ltd.

Date: 04-Apr-05

CLIENT: City of Arcata
Work Order: 0503261
Project: 000108.100, Arcata Corp Yard

QC SUMMARY REPORT

Method Blank

Sample ID: **MB-13208** Batch ID: **13208** Test Code: **BTXES** Units: **µg/g** Analysis Date: **3/22/05 10:11:47 PM** Prep Date: **3/22/05**
Client ID: Run ID: **ORGC8_050322B** SeqNo: **492175**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	ND	0.050									
Benzene	ND	0.0050									
Toluene	ND	0.0050									
Ethylbenzene	ND	0.0050									
m,p-Xylene	ND	0.0050									
o-Xylene	ND	0.0050									
Cis-1,2-Dichloroethylene	0.767	0.10	1.00	0	76.7%	72	135	0			

Sample ID: **MB-13208** Batch ID: **13208** Test Code: **BTXES** Units: **µg/g** Analysis Date: **3/23/05 1:46:41 PM** Prep Date: **3/22/05**
Client ID: Run ID: **ORGC8_050322B** SeqNo: **492189**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	ND	0.050									
Benzene	ND	0.0050									
Toluene	ND	0.0050									
Ethylbenzene	ND	0.0050									
m,p-Xylene	ND	0.0050									
o-Xylene	ND	0.0050									
Cis-1,2-Dichloroethylene	0.846	0.10	1.00	0	84.6%	72	135	0			

Sample ID: **MBLK 031105** Batch ID: **R33861** Test Code: **IONICS** Units: **µg/g** Analysis Date: **3/11/05 12:11:38 PM** Prep Date:
Client ID: Run ID: **INIC2_050311C** SeqNo: **489909**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as Nitrogen)	ND	1.0									J
Nitrite (as Nitrogen)	ND	1.0									J

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

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North Coast Laboratories, Ltd.

Date: 04-Apr-05

CLIENT: City of Arcata
Work Order: 0503261
Project: 000108.100, Arcata Corp Yard

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-13208** Batch ID: **13208** Test Code: **BTXES** Units: **µg/g** Analysis Date: **3/22/05 7:17:08 PM** Prep Date: **3/22/05**
Client ID: Run ID: **ORGC8_050322B** SeqNo: **492173**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	0.3714	0.050	0.400	0	92.8%	75	124	0			
Benzene	0.05066	0.0050	0.0500	0	101%	80	128	0			
Toluene	0.05293	0.0050	0.0500	0	106%	85	126	0			
Ethylbenzene	0.04921	0.0050	0.0500	0	98.4%	80	126	0			
m,p-Xylene	0.09743	0.0050	0.100	0	97.4%	84	130	0			
o-Xylene	0.04915	0.0050	0.0500	0	98.3%	84	125	0			
Cis-1,2-Dichloroethylene	1.07	0.10	1.00	0	107%	72	135	0			

Sample ID: **LCSD-13208** Batch ID: **13208** Test Code: **BTXES** Units: **µg/g** Analysis Date: **3/23/05 10:49:37 AM** Prep Date: **3/22/05**
Client ID: Run ID: **ORGC8_050322B** SeqNo: **492187**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	0.3643	0.050	0.400	0	91.1%	75	124	0.371	1.93%	15	
Benzene	0.04879	0.0050	0.0500	0	97.6%	80	128	0.0507	3.77%	15	
Toluene	0.05194	0.0050	0.0500	0	104%	85	126	0.0529	1.89%	15	
Ethylbenzene	0.04885	0.0050	0.0500	0	97.7%	80	126	0.0492	0.749%	15	
m,p-Xylene	0.09592	0.0050	0.100	0	95.9%	84	130	0.0974	1.56%	15	
o-Xylene	0.04847	0.0050	0.0500	0	96.9%	84	125	0.0492	1.40%	15	
Cis-1,2-Dichloroethylene	1.01	0.10	1.00	0	101%	72	135	1.07	5.38%	15	

Sample ID: **LCS 03110501** Batch ID: **R33861** Test Code: **IONICS** Units: **µg/g** Analysis Date: **3/11/05 12:27:16 PM** Prep Date:
Client ID: Run ID: **INIC2_050311C** SeqNo: **489910**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as Nitrogen)	10.04	1.0	10.0	0	100%	90	110	0			
Nitrite (as Nitrogen)	9.863	1.0	10.0	0	98.6%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

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CLIENT: City of Arcata
Work Order: 0503261
Project: 000108.100, Arcata Corp Yard

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: LCS	Batch ID: R34034	Test Code: NKJES	Units: µg/g	Analysis Date: 3/24/05	Prep Date: 3/22/05
Client ID:		Run ID: WC_050324G		SeqNo: 492417	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Kjeldahl Nitrogen	1,650	150	1,500	56.8	106%	70	113	0			

Sample ID: LCSD	Batch ID: R34034	Test Code: NKJES	Units: µg/g	Analysis Date: 3/24/05	Prep Date: 3/22/05
Client ID:		Run ID: WC_050324G		SeqNo: 492418	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Kjeldahl Nitrogen	1,635	150	1,500	56.8	105%	70	113	1,650	0.913%	25	

Sample ID: LCS	Batch ID: R33976	Test Code: PO4TOS	Units: µg/g	Analysis Date: 3/22/05	Prep Date: 3/22/05
Client ID:		Run ID: WC_050322D		SeqNo: 491513	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphate Phosphorus	24.48	2.0	25.0	0	97.9%	70	120	0			

Sample ID: LCSD	Batch ID: R33976	Test Code: PO4TOS	Units: µg/g	Analysis Date: 3/22/05	Prep Date: 3/22/05
Client ID:		Run ID: WC_050322D		SeqNo: 491514	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Phosphate Phosphorus	24.48	2.0	25.0	0	97.9%	70	120	24.5	0%	20	

Sample ID: LCS-13208-G	Batch ID: 13208	Test Code: TPHCGS	Units: µg/g	Analysis Date: 3/22/05 8:27:29 PM	Prep Date: 3/22/05
Client ID:		Run ID: ORGC8_050322A		SeqNo: 492137	

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	11.59	1.0	10.0	0	116%	94	140	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

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CLIENT: City of Arcata
Work Order: 0503261
Project: 000108.100, Arcata Corp Yard

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-13208-G** Batch ID: **13208** Test Code: **TPHCGS** Units: **µg/g** Analysis Date: **3/23/05 12:00:18 PM** Prep Date: **3/22/05**
Client ID: Run ID: **ORGC8_050322A** SeqNo: **492151**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gas (C6-C14)	11.14	1.0	10.0	0	111%	94	140	11.6	3.98%	15	

Sample ID: **LCS-13183** Batch ID: **13183** Test Code: **TPHDMS** Units: **µg/g** Analysis Date: **3/21/05 12:32:37 PM** Prep Date: **3/18/05**
Client ID: Run ID: **ORGC7_050321A** SeqNo: **491643**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	10.61	1.0	10.0	0	106%	85	153	0			
TPHC Motor Oil	21.27	10	20.0	0	106%	76	133	0			

Sample ID: **LCSD-13183** Batch ID: **13183** Test Code: **TPHDMS** Units: **µg/g** Analysis Date: **3/21/05 12:51:09 PM** Prep Date: **3/18/05**
Client ID: Run ID: **ORGC7_050321A** SeqNo: **491644**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	10.63	1.0	10.0	0	106%	85	153	10.6	0.202%	15	
TPHC Motor Oil	22.17	10	20.0	0	111%	76	133	21.3	4.14%	15	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

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Chain of Custody

LABORATORY NUMBER: 0503261

Attention: KIM WATSON
Results & Invoice to: City of Arcata
Address: 736 F Street
Arcata, CA 95521
Phone: ~~[illegible]~~ 822-5957
Copies of Report to: SHN (Mike Foget)
812 W. Wabash Ave, Eureka, CA 95501
Sampler (Sign & Print): Aaron D. Melody

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5-7 Day
☒ STD (2-3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☒ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

PROJECT INFORMATION
Project Number: 000108.100
Project Name: Arcata Corp Yard
Purchase Order Number:

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*
	SP-1A @ 1'	3-10-05	1030	S
	SP-1B @ 2'		1020	
	SP-1C @ 3'		1010	
	SP-1D @ 4'		955	
	SP-1E @ 1'		945	
	SP-1F @ 2'		935	
	SP-1G @ 3'		925	
	SP-1H @ 4'		915	

ANALYSIS	CONTAINER	PRESERVATIVE
TPHG/BTEX	11	no
TPHD/TPHMO	13	
C:N RATIO	12	
Total Nitrogen	12	
Total Org. Carbon	12	
Total Phosphorus	12	y
% Moisture	12	

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

Lab to composite 1A, 1B, 1C, & 1D into one sample
Lab to composite 1E, 1F, 1G, & 1H into one sample

on ice, intact

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
Aaron D. Melody Aaron Melody	3-10-05 1330	[signature]	3/10/05 1330

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

*MATRIX: DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT